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Development and Validation of Instruments Adoption FinTech services in Indonesia (Perspective of Trust and Risk)

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Abstract— This study explores the influence of trust and risk in the use of FinTech in Indonesian society. This exploration is based on findings from previous studies that suggest that trust and risk are important aspects in considering the use of FinTech. The focus of this research is to develop and validate the research instruments that will be used next. The basic theory of model development uses the theory of Technology Acceptance Model (TAM) developed by Davis. The models and instruments developed will be through pilot studies involving 133 communities as respondents. This Study is quantitative research and data obtained were analyzed using smart pls v3.0. This analysis is conducted to ensure the level of reliability and validity of the instrument. The results of this analysis find 31 instruments that are stated reliable and validity. So it can be used for collecting data from a survey in accordance with the research.

Keywords— Trust, Perceived Risk, FinTech, TAM

I. INTRODUCTION

In the era of technological developments that so rapidly affect all aspects of the business world today, not apart from the financial world. In the financial world, there has been a combination of information and financial technology which later became known as financial technology or FinTech [1]. FinTech is a new view of financial services that incorporate more effective IT technologies. The services provided become more efficient in the payment segment in a transaction [2]. Now FinTech is becoming a major change in the development of various business worlds and it also makes shifting the way financial transactions in the present era [3]. In the application of financial technology or called FinTech the business world will provide the ability to compete [4]. FinTech provides the speed and flexibility of its use [1],[5]. This service is carried out by companies to encourage consumers to move to change in payment methods to digital with technology[6].

The development of FinTech in Indonesia brought various parties to compete to provide various services. According to Teja [7] here are some business people who provide FinTech services such as BCA Bank with Sakuku, Bank Tabungan Pensiunan Nasional (BTPN) with Genius, Telkomsel with t-Cash, GoJek with Go-Pay, Grab with Grab-Pay and there are many others. With so many business vendors providing services to the products they spend, then every service must have its own advantages - each. In addition to providing these services vendors to increase the number of use of FinTech products, they need to know the behavior of consumers or users. Where Researchers will use

the Technology Acceptance Model (TAM) theory [8], [9] on a basic theoretical to find out the attitude of people's acceptance of the use of technology. Based on previous research there are elements that are very important that the influence of users in using FinTech is element of trust and risk [10],[11],[12]. In this study try to explore the use of this FinTech service from the risk and trust side of its users. In addition, the researchers are exploring the relationship between trust and risk to user behavior in using FinTech services.

II. METHODOLOGY

Stage of information systems research in the development of instruments to be used will go through several stages. The stage of research model development, defining the relationship between variables, defining the operational of each variable to be used in the research model, the development of indicators to be used, performing the measurement of variables by validating the instrument and looking at the reliability of the indicator used in the model. The steps are shown in Figure 1.

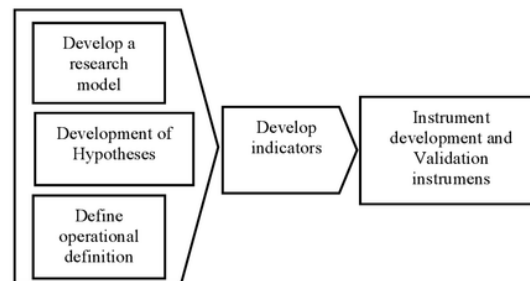


Fig. 1. Research methodology

III. ANALYSIS AND DISCUSSION

A. Research Model Development

This research develops a model based on the Theory Technology Acceptance Model (TAM) model developed by Davis. TAM model developed by Davis is an adoption of the theory of TRA, TRA is a theory that tells how the perception of one's actions in determining attitudes and behavior [13]. The TAM model itself is a model used to evaluate and

identify what elements affect human behavior on the acceptance of a developed technology [14]. Perceived Usefulness and Perceived Ease of Use are the two main variables contained in the TAM model to understand behavior.

Perceived Usefulness can be interpreted as the perception of users in using technology to give a benefit to themselves and Perceived Ease of Use is a user perception in using technology will provide convenience [15],[16]. In previous studies applying the TAM, model stated that Perceived Usefulness and Perceived Ease of Use give a huge influence on user decision in adopting a technology. But as to what makes it more interesting in this study, researchers will look at other factors that can affect users in adopting a technology. Factors of trust and risk factors into two other elements that are considered important.

1) Trust

Trust is an idea of belief, self-reliance, hope, dependability, reliability, integrity, the ability to characterize an entity from a thing. A user-owned trust is fundamental to the use of the FinTech service [17]. Steps to develop user trust, vendors must make good communication in order to maintain relationships [18],[19]. Other studies in this field have also found that trust as an important element for customers in adopting FinTech services [2],[17],[18],[19],[20], [21].

2) Perceived Risk

Researchers have been studying Risk Factors since 1960, which studies how to know the relationships of human behavior [22]. The perceived risk is a hope that becomes a loss that occurs when people decide to take an action [23],[24]. In a study conducted by Damghanian [22], on consumer behavior, it is often said that risks have a sense of multidimensional structure and consumers believe in the possible negative consequences of use. According to Lee and Ryu [25],[26], Risk has an important role and proposes several indicators related to elements of risk such as security, finances, social, time.

3) The relationship between Trust, Risk and behavior Intention to Use

In the interest in the use of technology by the user will need to understand the relationship between trust and risk. In many studies, many are interested in describing the relationship between them [27]. Interacting with other individuals, which are certainly independent and not entirely predictable, combined with the innate need to understand the actions of others, present people with remarkable complexity. Studies conducted by Kim and Prabhakar [19] explore the relationship between trust and risk impact in a user's behavior in using or adopting the technology. They also suggest the elements of trust and risk are independent of each other but they will affect from the perception of the use of the technology.



Fig. 2. Relationship Trust, Risk, and Behavior intention to use (Independent Relationship)

Researchers are interested in conducting study on the influence of trust elements and the impact of risk on the effects of user behavior on using FinTech services. This study applies an independent relationship expressed by Kim and Prabhakar that can affect user behavior. Researchers describe the research model that can be seen in Figure 3.

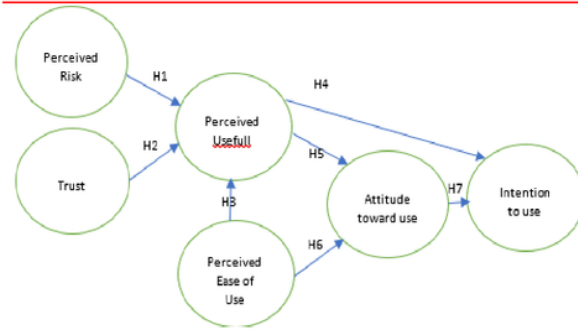


Fig. 3. research model developed

B. Development of Hypotheses

Development of Hypotheses adapted to the development of research models. In the research model, we describe the relationship between variables, where there are 3 independent variables: "trust", "perceived risk" and "perceived ease of use", and there are 3 dependent variables: "Perceived Useful, Attitude toward use, Intention to use". Thus the researcher built Hypothesis as follows:

- H1: Perceived Risk positively influences Perceived Usefulness using the FinTech.
- H2: Perceived Usefulness positively influence Attitude towards using the FinTech.
- H3: Perceived Ease of Use positively influence Perceived Usefulness uses the FinTech.
- H4: Perceived Usefulness positively influence the intention of using the FinTech.
- H5: Perceived Usefulness positively influence Attitude towards using the FinTech.
- H6: Perceived Ease of Use positively influences the Attitude towards of FinTech.
- H7: Attitude towards using FinTech has a positive effect on the intention of using them.

TABLE I. DEFINITION OF VARIABLES IN RESEARCH

| Variable | Definition | Ref |
|-----------------------|---|------------------|
| Perceived Usefulness | The trust of a person is using a particular system will improve performance. | [8], [9], [15] |
| Perceived Ease of Use | Consumer Confidence that the use of the FinTech Service is easy and does not require too much effort to learn | [9], [15] |
| Attitude towards | The level of consumer evaluations of the use of the FinTech Service | [9], [15] |
| Intention to use | Subjective assessment of the consumer about the possible willingness to use the FinTech Services in the future | [9], [15], [21] |
| Trust | Trust is an idea of belief, self-reliance, hope, dependability, reliability, integrity, the ability to characterize an entity from a thing. | [2], [17]–[21] |
| Perceived Risk | Perceived risk is a hope that becomes a loss that occurs when people decide to take an action | [21], [23], [24] |

TABLE II. VARIABLE AND INDICATORS

| Variable | code | Indicators | Ref |
|-----------------------|------|--|------|
| Perceived Usefulness | PU1 | I think using FinTech service can make understanding more efficient | [9] |
| | PU2 | I think using the FinTech service will not be limited by time and location restrictions, which really helped me | [9] |
| | PU3 | I think using the FinTech service can make life more comfortable | [9] |
| | PU4 | I think I can get information quickly using FinTech service | [9] |
| | PU5 | By using the FinTech service, I am aware of the enormous technological developments | [21] |
| | PU6 | FinTech service helps me learn to operate Smartphone | [21] |
| | PU7 | The FinTech service provided helps me to live more economically | [21] |
| Perceived Ease of Use | PE1 | Downloading the FinTech service application program from the internet is easy | [9] |
| | PE2 | Completing the transaction using FinTech service is easy | [9] |
| | PE3 | Using the FinTech service without reading the guide is easy | [9] |
| | PE4 | Studying the FinTech service is easy without spending too much time. | [9] |
| | PE5 | Transact using FinTech services more effectively than using cash | [21] |
| | PE6 | I feel calm despite not bringing in cash because of the FinTech service | [21] |
| | PE7 | I feel secure about the use of FinTech services | [21] |
| Attitude towards | AT1 | I think it is very easy to find information using FinTech service anytime and anywhere | [9] |
| | AT2 | I think using the FinTech service is a great idea | [9] |
| | AT3 | I only use services that adopt FinTech services | [9] |
| | AT4 | I like the idea of using the FinTech service | [21] |
| | AT5 | I want to invest using FinTech services | [21] |
| | AT6 | I hope there is a FinTech-based service for lending / owed transactions | [21] |
| | AT7 | I want the FinTech service to allow E-Money transfers to others with a certain nominal amount to my liking | [21] |
| Intention to use | IU1 | I want to use the services provided by the FinTech service | [9] |
| | IU2 | I want to use the FinTech service to connect information | [9] |
| | IU3 | I continue to increase the frequency of use of FinTech's services in Economic Sharing Transportation | [9] |
| | IU4 | I believe in the future frequency of use of FinTech services in my Economic Sharing Transportation will continue to increase | [21] |
| | IU5 | I do Top Up / Refill FinTech on Economic Sharing Transportation service | [21] |
| | IU6 | I often use or use promo provided by Economic Sharing Transportation service | [21] |
| | IU7 | I will use the FinTech service no matter what | [21] |
| Trust | TR1 | I believe the transaction system for FinTech services is safe | [21] |
| | TR2 | I believe the transaction process and results from FinTech are correct | [21] |
| | TR3 | I believe the promos offered are easy to exchange (demoted) using FinTech. | [21] |
| | TR4 | I believe creating an account and password for balance access at FinTech that is available makes security increase | [21] |
| | TR5 | Top-ups done with FinTech are easy to do | [21] |
| Perceived Risk | PR1 | You know the risk of using FinTech | [21] |
| | PR2 | You are sure you will not have problems with your balance on FinTech | [21] |
| | PR3 | You believe the risk of using FinTech is | [21] |

| | | |
|-----|---|------|
| | low | |
| PR4 | The funds you enter (TopUp) for FinTech | [21] |
| PR5 | You after top up the last balance | [21] |
| PR6 | You top up your balance for 1-week transaction | [21] |
| PR7 | You feel comfortable with the information/data on FinTech that you have | [21] |

C. Evaluate the instrument

Instrument evaluation is a standard step done in quantitative research. The study examined the validity and reliability of the research instrument. This evaluation is done by distributing the instrument that is designed to the respondent. Data collection is done by way of an online survey by using google form. Distributors are conducted throughout Indonesia through social media and internet network for two months. Technic of taking minimum sample according to hair[28] is five times from a number of research indicator. Respondents who obtained 145 respondents, after the selection there were 133 respondents who declared valid. The assessment process is the most important process prior to the evaluation of the hypothesis.

1) Reliability Test

The reliability of the instrument is expressed by the composite reliability value, the Cronbach alpha value and AVE (average of the variance extracted). According to Barclay [29], the value of AVE must exceed 0.5 for good reliability and Hair[30] said for Cronbach alpha value must exceed 0.7. In Table 3 we can see the values of composite reliability above 0.8, Cronbach's alpha above 0.7 and AVE value (average variance extracted) above 0.5. Therefore, it has been said that the developed instrument is reliable, so it can be used for the actual survey.

TABLE III. RELIABILITY TEST

| VAR | Number of Indicators | Cronbachs Alpha | Composite Reliability | AVE |
|-----|----------------------|-----------------|-----------------------|----------|
| AT | 4 | 0.81448 | 0.879326 | 0.648178 |
| IU | 7 | 0.867303 | 0.898204 | 0.559436 |
| PE | 6 | 0.822728 | 0.870888 | 0.530469 |
| PR | 4 | 0.755231 | 0.847008 | 0.583781 |
| PU | 5 | 0.836622 | 0.884518 | 0.605806 |
| T | 5 | 0.826002 | 0.87681 | 0.587935 |

From this process, final produces 6 constructs and has 31 indicators which can be seen in the table

TABLE IV. VARIABLE AND INDICATORS

| Var | Number of Indicators | Indicator |
|-----|----------------------|-----------------------|
| AT | 4 | AT1, 2, 4, 7 |
| IU | 7 | IU1, 2, 3, 4, 5, 6, 7 |
| PE | 6 | PE1, 2, 3, 4, 5, 6 |
| PR | 4 | PR1, 2, 3, 7 |
| PU | 5 | PU1, 2, 3, 4, 5 |
| T | 5 | T1, 2, 3, 4, 5 |

2) Validity Test

Test validity can be performed evaluation "construct validity". "Construct validity" aims to evaluate the measurement of a theoretical constituent in the testing process. This test is done by two approaches: first with factor analysis and the relationship of characteristic traits of each other variable. Convergence validity standard, when if the cross loading factor for each indicator in the construct is above 0.6 [31], [32].

a) Analysis of Factors

Factor analysis utilizes the contract validation in identifying and knowing the strength of the indicator. This illustrates that factor analysis can be useful in simplifying a test or more by subtracting a number of categories into several factors

b) Convergent Validity

Construct validity is a test of the correlation and convergence of the indicator to the variables. Indicators of a variable when converging or correlating with other indicators in the same variables theoretically.

c) Discriminant Validity

Discriminative validity is an examination of the instrument to show the correlation of those variables which show unrelated low or negative and positive correlations for related variables.

TABLE V. CROSS LOADING FACTOR

| | T | PU | PE | AT | IU | PR |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|
| AT1 | 0.502 | 0.663 | 0.678 | 0.794 | 0.608 | 0.459 |
| AT2 | 0.621 | 0.688 | 0.708 | 0.830 | 0.661 | 0.430 |
| AT4 | 0.615 | 0.731 | 0.744 | 0.917 | 0.762 | 0.509 |
| AT7 | 0.337 | 0.389 | 0.481 | 0.676 | 0.647 | 0.480 |
| IU1 | 0.517 | 0.583 | 0.665 | 0.740 | 0.826 | 0.576 |
| IU2 | 0.459 | 0.538 | 0.596 | 0.700 | 0.783 | 0.576 |
| IU3 | 0.394 | 0.534 | 0.588 | 0.654 | 0.820 | 0.441 |
| IU4 | 0.456 | 0.559 | 0.554 | 0.612 | 0.774 | 0.390 |
| IU5 | 0.463 | 0.486 | 0.536 | 0.576 | 0.734 | 0.386 |
| IU6 | 0.383 | 0.380 | 0.442 | 0.535 | 0.703 | 0.370 |
| IU7 | 0.293 | 0.430 | 0.436 | 0.526 | 0.640 | 0.417 |
| PE1 | 0.469 | 0.472 | 0.629 | 0.450 | 0.424 | 0.349 |
| PE2 | 0.616 | 0.690 | 0.783 | 0.646 | 0.586 | 0.491 |
| PE3 | 0.567 | 0.484 | 0.662 | 0.465 | 0.393 | 0.224 |
| PE4 | 0.554 | 0.580 | 0.757 | 0.536 | 0.446 | 0.348 |
| PE5 | 0.470 | 0.625 | 0.712 | 0.621 | 0.546 | 0.394 |
| PE6 | 0.354 | 0.470 | 0.626 | 0.546 | 0.520 | 0.313 |
| 5 7 | 0.582 | 0.654 | 0.757 | 0.706 | 0.636 | 0.505 |
| PR1 | 0.328 | 0.374 | 0.376 | 0.468 | 0.508 | 0.655 |
| PR2 | 0.360 | 0.406 | 0.418 | 0.437 | 0.459 | 0.860 |
| PR3 | 0.384 | 0.409 | 0.434 | 0.428 | 0.442 | 0.827 |
| 2 7 | 0.441 | 0.411 | 0.433 | 0.436 | 0.443 | 0.709 |
| PU1 | 0.619 | 0.814 | 0.647 | 0.608 | 0.518 | 0.455 |
| PU2 | 0.566 | 0.775 | 0.608 | 0.537 | 0.448 | 0.382 |
| PU3 | 0.654 | 0.845 | 0.728 | 0.723 | 0.643 | 0.521 |
| PU4 | 0.517 | 0.762 | 0.572 | 0.606 | 0.519 | 0.374 |
| PU5 | 0.448 | 0.711 | 0.626 | 0.538 | 0.462 | 0.286 |
| T1 | 0.751 | 0.465 | 0.521 | 0.462 | 0.434 | 0.366 |
| T2 | 0.827 | 0.645 | 0.625 | 0.548 | 0.455 | 0.393 |
| T3 | 0.774 | 0.562 | 0.555 | 0.542 | 0.494 | 0.364 |
| T4 | 0.715 | 0.424 | 0.492 | 0.446 | 0.357 | 0.280 |
| T5 | 0.741 | 0.604 | 0.584 | 0.474 | 0.404 | 0.461 |

TABLE VI. DISCRIMINANT VALIDITY

| Var | AVE | T | PU | PE | AT | UI | PR |
|-----|----------|-------|-------|-------|-------|-------|-------|
| T | 0.587935 | 0.762 | | | | | |
| PU | 0.605806 | 0.722 | 0.783 | | | | |
| PE | 0.530469 | 0.734 | 0.816 | 0.706 | | | |
| AT | 0.648178 | 0.652 | 0.776 | 0.815 | 0.809 | | |
| IU | 0.559436 | 0.565 | 0.669 | 0.729 | 0.828 | 0.757 | |
| PR | 0.583781 | 0.496 | 0.524 | 0.544 | 0.577 | 0.604 | 0.767 |

IV. CONCLUSION

This research develops the instrument and has been validated so that it can be used to see the value of the influence of the elements of trust and risk, as well as the impact on the user's behavior when adopting the services of Fintech. The developed instrument has been validated and meets the criteria of the validated instrument. Research dating from researchers can use these instruments to real data and larger samples. The samples can be distributed online, in order to obtain increasingly large sample quantities.

V. LIMITATION

This research only develops and validation of an instrument in adoption FinTech service perspective of trust and risk in Indonesia. Once this instrument is validated it can be used with the TAM model developed with variable trust and perceived risk. This model can be used to see the influence of trust and perceived risk from the adoption of the use of FinTech services in Indonesia. This study has limited limitations in obtaining samples due to time and so on, but this research will continue continuously.

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